

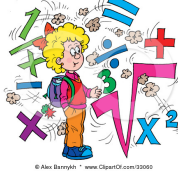
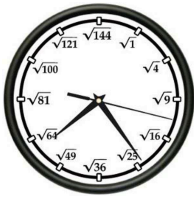
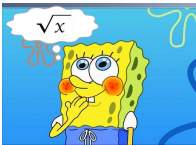
Chapter 6 Square Roots & the Pythagorean Theorem

6.3 Estimating Square Roots Lesson

Unit Question: How do we use signs and symbols to help us?

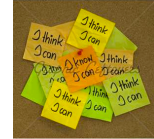
Learner Profile: Inquirer

Area of Interaction: Human Ingenuity



I Can Statement:

I can approximate square roots



Before we learn to approximate we need to understand two types of numbers

The two types of numbers in math are:

Rationals **Irrationals**

These two types of numbers make up all of the numbers

Rationals and Irrationals make up all Real numbers

Rational Numbers

Rational numbers can be written as a fraction between two integers. (Integers are the positive and negative counting numbers, like 1,2,3... or -1,-2,-3...) $\frac{a}{b}$, where $b \neq 0$

Examples: $\frac{7}{8}$ $\frac{784}{25}$ 10.5
 $-\frac{1}{3}$ $-\frac{8}{2}$ $\sqrt{4}=2$

Rational Numbers

Rational numbers aren't always written like a fraction.

Example: 1.25 is rational because you can write it as $\frac{5}{4}$

Rational Numbers

Match the decimal number with the fraction you think it belongs to.

3.5 — $\frac{9}{4}$ — $\frac{7}{2}$
 2.25 — $\frac{9}{4}$
 3.25 — $\frac{13}{4}$
 .44444444 — $\frac{4}{9}$

0. $\overline{4}$
 $10n = 4.\overline{4444}$
 $n = 0.\overline{4444}$
 $9n = 4$
 $n = \frac{4}{9}$

$$1.\overline{63}$$

$$\begin{array}{r} 100n = 163.\overline{6363} \\ n = 1.\overline{6363} \dots \\ \hline 99n = 162 \quad \frac{162}{99} \quad \frac{54}{33} \quad \frac{18}{11} \end{array}$$

Rational Numbers

Is $1.3333333\overline{3}$ a rational number? If so, what two integers do you divide to equal $1.333333\overline{3}$?

Irrational Numbers

Irrational numbers are impossible to write as a fraction and go on and on and on...

Example: 1.4142135...

Rational Numbers

VS.

Irrational Numbers

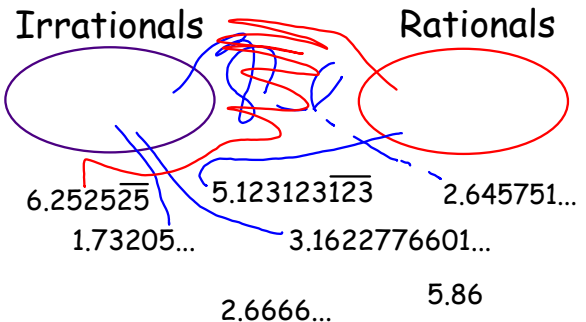
What's the difference between rationals and irrationals?

Recognize rationals and irrationals
when they're in decimal form

Rational Numbers terminate or
repeat after the decimal.

Irrational Numbers do not
terminate and do not repeat after
the decimal.

Categorize the decimals
into the correct oval



Now we can start
approximating square roots

Fill in the blanks with the two
words below

Most square roots are _____

Only some are _____

Rational

Irrational

Approximating Square Roots
Continued

List two square roots below
that you think are rational

Approximating Square Roots Continued

Rearrange the square roots into the correct order on the number line.

$\sqrt{4}$ $\sqrt{9}$ $\sqrt{16}$ $\sqrt{36}$ $\sqrt{64}$ $\sqrt{81}$

Approximating Square Roots Continued

Put $\sqrt{10}$, $\sqrt{18}$, and $\sqrt{7}$ in their place, then approximate their value.

Key Idea: Use the rational square roots to approximate the irrational square roots.

Rules for approximating square roots



1. Think of a perfect square that is close to the radicand
2. Do the square root of your perfect square
3. Make your prediction

Practice Examples

Approximate $\sqrt{52}$

- 1.) 52 is close to what perfect square? $\sqrt{49}$
 $\sqrt{49} = 7$
- 2.) What is the square root of the perfect square you answered in number 1? 7
- 3.) What is your prediction of $\sqrt{52}$? 7.2

Practice Examples

Approximate $\sqrt{62}$

- 1.) 62 is close to what perfect square? ____
- 2.) What is the square root of the perfect square you answered in number 1? ____
- 3.) What is your prediction of $\sqrt{62}$? ____

On your own

Approximate these:

$\sqrt{24}$

$\sqrt{5}$

$\sqrt{37}$

$\sqrt{48}$

$\sqrt{99}$

$\sqrt{79}$

Homework

Textbook p249-250 1-4all,
16-30even, 31-33all